ABSTRACT OF THE DISCLOSURE

A reactor for growing epitaxial layers includes a reaction chamber having a passthrough opening for inserting and removing wafer carriers from the reaction chamber. A reactor also includes a cylindrical shutter located inside the reaction chamber for selectively closing the passthrough opening. The cylindrical shutter is movable between a first position for closing the passthrough opening and a second position for opening the passthrough opening. The cylindrical shutter includes an internal cavity adapted to receive a cooling fluid and tubing for introducing the cooling fluid into the internal cavity. The tubing is permanently secured to the shutter and moves simultaneously therewith. The cylindrical shutter substantially surrounds an outer perimeter of the wafer carrier, thereby minimizing nonuniformity in the temperature and flow field characteristics of the reactant gases.